CLAIMS

1.   An image processing system having image data processing means of automatic
adaptation of 3-D surface Model to image features, for Model-based image segmentation,
5   comprising means of dynamic adaptation of the Model resolution to image features including
means of locally setting higher resolution when reliable image features are found and means
of setting lower resolution in the opposite case; and comprising viewing means for
visualizing the images.

10   2.   The system of claim 1, having data processing means to define a feature confidence
parameter for each image feature, and to locally adapt model resolution according to it.

3.   The system of Claim 2, having data processing means to define a feature confidence
parameter as a parameter that depends on the feature distance and on the estimation of quality
15   of this feature including estimation of noise, and
        having data processing means to penalize the large distances and the noisy, although
close features.

4.   The system of Claim 3, having data processing means for decreasing the resolution of
20   the Model in absence of confidence and gradually increasing the resolution of the Model with
the rise of feature confidence.

5.   The system of Claim 4, having data processing means for causing low local resolution
to constraint local surface curvature, for preventing the model surface from self-intersections.
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6.   The system of one of Claims 1 to 5, having means to made feature confidence
available for model adaptation, comprising means to display the Model regions with different
colors representing the confidence at the location of said regions for the user to supervise the
deformation process of the Model and to locally assess its final quality.
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7.   Image processing system of one of Claims 1 to 6, for the segmentation of a three
dimensional object in a three dimensional image including data processing means for
mapping a three dimensional mesh model onto said three dimensional object comprising
means for:

Acquiring a three-dimensional image of an object of interest to be segmented, generating a Mesh Model, formed of polygonal cells and deforming the Mesh Model in order to map said Mesh Model onto said object of interest.

5   8.   The image processing system of one of Claims 1 to 7, further comprising means for:

Constructing a Color Coding Table wherein predetermined colors are associated to given confidence parameter values;

Associating the confidence parameter values of a given cell of the Mesh Model to a color given by the color coding Table corresponding to said confidence parameter values.

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9.   The image processing system of Claim 8, further comprising data processing means for:

Performing a color coding operation by attributing to said given cell, the color determined from the Color Coding Table, corresponding to the confidence parameter values;

15   and display means for:

Displaying the image of the Mesh Model having cells colored according to the color-coding operation.

10.   The image processing system of Claim 9, wherein the color-coding operation is

20   performed for all the cells or for a predetermined number of cells.

11.   The image processing system of one of Claims 1 to 10, further comprising means for:

Taking a decision to stop the process of mapping the Mesh Model onto the object of

25   reference in function of a predetermined confidence level.

12.   A medical imaging system comprising a suitably programmed computer or a special purpose processor having circuit means, which are arranged to form an image processing system as claimed in one of Claims 1 to 11 to process medical image data;

30   and display means to display the images.

13.   A medical examination imaging apparatus having:

Means to acquire a three-dimensional image of an organ of a body; and

a medical imaging system according to Claim 12

14.   A computer program product comprising a set of instructions to be used in a system
as claimed in one of Claims 1 to 11.

5   15.   An image processing method, comprising steps of:
        acquiring image data of a 3-D image with image features, and automatically
adapting 3-D surface Model to image features, for Model-based image segmentation,
whereby:
        dynamically adapting the Model resolution to image features including locally
10   setting higher resolution when reliable image features are found and setting lower resolution
in the opposite case; and comprising steps of visualizing the images.